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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/653,751	09/03/2003	Margaret E. Knight	5760-12800	3666

7590 08/16/2006
Jeffrey C. Hood
Meyertons, Hood, Kivlin, Kowert & Goetzel PC
P.O. Box 398
Austin, TX 78767

EXAMINER

NGUYEN, HIEP T

ART UNIT PAPER NUMBER

2187

DATE MAILED: 08/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/653,751

Applicant(s)

KNIGHT ET AL.

Examiner

Hiep T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13-29, 35 and 36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 35 and 36 is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-11, 13-22 and 26-29 is/are rejected.
- 7) ☒ Claim(s) 6-8 and 23-25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office action is a response to the amendment filed May 30, 2006. The applicant has canceled claims 12 and 30-34. Claims 1-11, 13-29 and newly added claims 35-36 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - a. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
3. Claims 1-5, 9-11, 13-22, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patterson et al., U.S. patent No. 6,912,635 [hereafter, Patterson] in view of well-known features of which Official Notice is hereby taken.
 - a. As per claim 1:
 - i. Patterson teaches a method for balancing input/output load for a plurality of storage devices (216), the method comprising:
 1. Monitoring accesses to addresses or sectors located on the storage devices col. 6, lines 24-32];
 2. Storing data indicating the access frequency to each address or sector; and determining a list of most recently used addresses or sectors based on the data indicating the access frequency [col. 6, lines 32-39]; and
 3. Balancing the most frequently used data at the addresses or sectors across the plurality of storage devices col. 6, line 40 through col. 7, line 5].

- ii. Patterson, however, does not teach that his addresses are chunks comprise one or more file system clusters. Furthermore, Patterson does not explicitly teach that his step of determining the list of most frequently used chunks and said balancing the most frequently used chunks across the plurality of storage devices are performed repeatedly at time intervals.
- iii. Organize information in units of chunks or file system clusters have been known and commonly practiced in the pertinent art. Furthermore, one having ordinary skill in the art looking at the teaching of Patterson would readily recognize that the addresses being monitored by the system could be any commonly used/practiced unit of storage including chunks and/or file system clusters. Moreover, One having ordinary skill in the art at the time the invention was made would readily recognize that the Patterson operation for determining and balancing the most frequently used data sectors among the storage device is not a one time operation but rather a repeatedly operation. This is because who would design a circuit for monitoring the accesses to particular data blocks then use the monitored information for determining and balancing the most frequently used blocks among the storage devices just one time and never do it again.
- iv. Accordingly, it would have been obvious to one having ordinary skill in the pertinent art at the time the invention was made to further configure the Patterson system to monitor and determine the most recently used addresses in the unit of chunks and/or file system clusters. It would have been obvious because it is no more than selecting an address unit among well known and commonly used address units in the pertinent art to be monitored. The tradeoffs between selecting a large address unit [e.g., chunk and/or file system clusters] and selecting small address unit [block, sector] to monitored is within the level of ordinary skill in the art.

- v. Furthermore, it would have been obvious [if not already inherent in the Patterson operation] to one having ordinary skill in the art at the time the invention was made to further configured the Patterson system to repeatedly carry out the determining and balancing steps at a certain time interval.
- b. As per claim 2: the further claimed limitation of "wherein the plurality of storage devices comprises a plurality of disks" is directly taught by Patterson [see figure 2].
- c. As per claim 3: similarly to claim 1: organizing and/or configured storage location in units of volumes having a plurality of chunks has also been known and commonly practiced in the pertinent art. Again selecting an address unit among well known and commonly used address units in the pertinent art to be monitored would have been obvious to one having ordinary skill in the pertinent art at the time the invention was made.
- d. As per claims 4-5 and 10:
 - i. Graphical user interface has also been known and widely used in the pertinent art for displaying information to be monitored and/or control parameters. Accordingly it would have been obvious to one having ordinary skill in the pertinent art at the time the invention was made to employ a graphical user interface for displaying the information relating the to memory addresses being monitored by the system and/or control parameters that are input from a user. The advantage of using graphical user interface would have been readily recognized by one having ordinary skill in the art at the time the invention was made.
- e. As per claim 9: the further claimed limitation of monitoring read and/or write accesses the chunks would follow necessarily when the Patterson system is configured to monitor addresses in units of chunks as mentioned above.
- f. As per claim 11, the further claimed limitations would also follow necessarily when the Patterson system is configured to monitor addresses in the units of chunks, in the manner as mentioned in the rejection of claim 1 above.

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- g. As per claims 13-15: selecting a memory location that can be accessed rapidly such as the center of a disk for storing most frequently accessed data has also been known and commonly practiced in the pertinent art. Accordingly, it would have been obvious to one having ordinary skill in the art to further configure the Patterson system to select a memory location [e.g., the center of the disk] in a second memory device that can be accessed rapidly to store the most recently used data that was migrated from the first storage device.
- h. As per claims 16-17, the claimed method basically encompass the same scope as that of claims 1-2 with an exception that the address unit being monitored is in clusters instead of chunks as claimed in claims 1-2. Again, selecting an address unit among the well-known units to be monitored would have been obvious to one having ordinary skill in the art at the time the invention was made for the same reason as set forth for that in the rejection of claim 1.
- i. As per claims 16-22 and 26-29: the claimed system basically encompasses the necessary elements for carrying the claimed steps in claims 1-5, and 9-15. Accordingly, claims 16-22 and 26-29 are rejected for the same reasons as set forth for that in claims 1-5 and 9-15.

Allowable Subject Matter

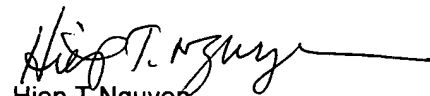
- 4. Claims 35-36 are allowed over the prior art of record because none of the prior art of record teaches or fairly suggests the operation of balancing the monitored most frequently used data chunk in accordance with the user input that specify a specific chunk size or the number of most frequently used chunks.
- 5. Claims 6-8 and 23-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - a. Kamiyama, 5893,139 teaches an operation of relocating the concentrated most frequently used data blocks among storage devices.
7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
8. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hiep T. Nguyen whose telephone number is (571) 272-4197. The examiner can normally be reached on Monday-Friday from 9:30 am to 6:00 pm.
10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Hiep T. Nguyen
Primary Examiner
Art Unit 2187

HTN